

FACT SHEET

WEST NILE FEVER

The following information will help you to become familiar with the epidemiology, symptomatology, ecology and control of West Nile Fever.

WHAT IS WEST NILE FEVER?

West Nile Fever is an infectious mosquito-borne disease found throughout Europe, Russia, Africa, Southwest Asia, Indonesia and India. It has also recently been diagnosed in the United States. West Nile Fever is transmitted through the bite of mosquitoes primarily in the genus *Culex*, which are infected with the West Nile Virus. West Nile Virus is a member of the Japanese encephalitis antigenic complex of the Genus *Flavivirus*, Family *Flaviviridae*. All known members of this complex are transmissible by mosquitoes and many of them can cause febrile, sometimes fatal, illnesses in humans.

In some patients, the virus may produce encephalitis, an inflammation of the brain. West Nile Virus is closely related to the St. Louis encephalitis Virus that is commonly found in the United States.

The presence of the virus in Europe was first suspected in Albania in 1958. It was confirmed when the virus was isolated in France and Russia in 1963. Since that time, the virus has been isolated in Portugal, Slovakia, Moldavia, Ukraine, Hungary, Romania, Czech Republic Italy, Spain, Serbia, Croatia, Montenegro, Bosnia, Albania, Greece, Bulgaria, Austria and Belarus. A 1996-1997 outbreak in Romania recorded more than 500 clinical cases and a case fatality rate of almost 10%.

HOW IS WEST NILE FEVER TRANSMITTED?

In Europe, the principle vectors of West Nile Fever are *Culex pipiens*, *Cx. modestus* and *Coquillettidia richiardii*. Mosquitoes become infected by feeding on birds that have been exposed to West Nile Virus. West Nile Virus can not be transmitted person to person. Direct contact with patients poses no risk to health care workers. Birds are one of the few species that are capable of reaching levels of viremia high enough to infect mosquitoes. Levels of viremia in humans are not high enough to infect mosquitoes.

Peak months for mosquito activity in Central Europe are May through September. The European vectors are

active mainly during the hours of darkness, remaining inactive during daylight.

Only female mosquitoes are capable of transmitting the disease. Male mosquitoes are plant feeders and do not bite humans.

The virus has occasionally been isolated from both soft and hard ticks and laboratory transmission has been observed in *Ornithodoros savignyi*, *O. moubata*, *O. maritimus*, *O. erraticus*, *Rhipicephalus sanguineus*, *R. rossicus*, *Dermacentor reticulatus* and *Haemaphysalis leachii*. While there have been no reported cases of transmission by ticks, these laboratory tests indicate that it is theoretically possible that other hematophagous arthropods may act as vectors.

In a Romanian study, it was found that only one out of every 325 individuals exposed to the disease through the bite of infected mosquitoes actually developed symptoms. This indicates that a large number of infections are subclinical.

WHAT ARE THE SYMPTOMS?

West Nile Fever in humans is usually a febrile, influenza-like illness, characterized by an abrupt onset (incubation period 3 to 6 days), moderate to high fever (3 to 5 days), headache, sore throat, backache, myalgia, arthralgia, fatigue, conjunctivitis, retrobulbar pain, maculopapular to roseolar rash (in approximately half of all cases, spreading from the trunk to the extremities and head), lymphadenopathy, anorexia, nausea, abdominal pain, diarrhea, and respiratory symptoms. In approximately 15% of cases, acute aseptic meningitis or encephalitis, anterior myelitis, hepatosplenomegaly, hepatitis, pancreatitis and myocarditis occur. Laboratory findings involve a slightly increased sedimentation rate and a mild leukocytosis; cerebrospinal fluid (CSF) in patients with central nervous system involvement is clear, with moderate pleocytosis and elevated protein. The virus can be recovered from the blood for up to 10 days in immunocompetent febrile patients and as late as 22 to 28 days after infection in immunocompromised patients. Peak viremia occurs 4 to 8 days post-infection.

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Recovery is complete and permanent sequelae have not been reported. Most fatalities have been recorded in patients older than 50 years of age, but young children and immunocompromised patients should also be considered high risk

HOW IS WEST NILE FEVER DIAGNOSED?

Patients demonstrating meningeal signs or neurologic complications and for whom other possible etiologies have been ruled out, should be tested for West Nile Virus. Acute and convalescent sera or CSF should be sent refrigerated to the Commander, ATTN: Special Pathogens Branch, U.S. Army Medical Research Institute of Infectious Diseases, 1425 Porter Street, Fort Detrick MD 21702-5100. Specimens will be tested using research assays based upon the enzyme-linked immunoassay and the polymerase chain reaction. There are currently no FDA-licensed diagnostic assays available.

WHAT IS THE TREATMENT FOR WEST NILE VIRUS?

Although there is no specific therapy, the symptoms and complications of the disease can be treated. Intensive support therapy is indicated in more severe cases

HOW IS WEST NILE FEVER PREVENTED?

Minimizing exposure to mosquito bites prevents infection with West Nile Virus. If possible, stay indoors during the hours of darkness, this is when the vectors are actively feeding. Make sure windows and doors are covered with screens that are serviceable and do not have any holes. Wear long-sleeved shirt, long pants and socks whenever you are outdoors. Loose fitting clothing prevents mosquito bites through thin fabric. Use insect repellents that have been approved by the Environmental Protection Agency.

For your skin, use a product that contains 20-50% **DEET** (N,N-diethyl-meta-toluamide). **DEET** in higher concentrations is not more effective. Do not use **DEET** on children below the age of 3 Years. Apply **DEET** lightly and evenly to exposed skin; do not use beneath clothing. Avoid contact with eyes, lips and broken or irritated skin. To apply to your face, first place a small amount of **DEET** onto your hands and then carefully spread a thin layer. Do not inhale aerosol formulations.

Wash **DEET** off when your exposure to mosquitoes ceases.

For your clothing, use an insect repellent spray to help prevent bites through the fabric. Use products that contain either **PERMETHRIN** or **DEET**.

PERMETHRIN is available commercially as a 0.5% spray formulation. When using any insect repellent, always **FOLLOW THE LABEL DIRECTIONS**.

Risk of infection with West Nile Virus can be significantly reduced by using the **DOD INSECT REPELLENT SYSTEM**. In addition to the proper wear of the battle dress uniform (BDUs), which provide a physical barrier to insects, this system includes the concurrent use of both skin and clothing repellents:

Standard military skin repellent, **INSECT/ARTHROPOD REPELLENT LOTION**, 33% **DEET**, long acting formulation, 1 application lasts up to 12 hours, **NSN 6840-01-284-3982**

Standard military clothing repellents, either: **PERMETHRIN ARTHROPOD REPELLENT**, Clothing Application (aerosol spray), 0.5% **PERMETHRIN**, 1 application lasts through 5 – 6 washes **NSN 6840-01-278-1336**; or **INSECT/ARTHROPOD REPELLENT TREATMENT** (impregnation kit), 40% **PERMETHRIN**, 1 application lasts the life of the uniform, **NSN 6840-01-345-0237**. Dry cleaning uniforms will remove **PERMETHRIN** from the clothing and will require re-treatment.

When deployed to mosquito infested areas, additional protection may be required. **INSECT NET PROTECTOR, FIELD** (bed netting), **NSN 7210-01-364-2197** when treated with **PERMETHRIN** will protect troops from vector-borne diseases while sleeping.